

# MicroVAX 3100 Model 40 and Model 80

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## Troubleshooting and Diagnostic Information

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This manual describes the troubleshooting procedures and diagnostic commands that you can use to solve basic problems with the MicroVAX 3100 Model 40 and Model 80 systems.

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# Preface

This manual describes the troubleshooting procedures and diagnostic commands that you can use to solve basic problems with the MicroVAX™ 3100 Model 40 and Model 80 systems.

## Audience

This manual is intended for people who have some experience of computers.

## Structure of This Manual

This manual has one chapter and an index.

## Additional Information

See the *MicroVAX 3100 Model 40 and Model 80 Operator Information* manual for the list of associated and related documents.



## Conventions

The following conventions are used in this manual:

Convention	Description
MONOSPACE	Text displayed on the screen is shown in monospace type.
<i>italic type</i>	Italic type emphasizes important information and indicates the complete titles of manuals.
<b>boldface type</b>	Boldface type in examples indicates user input. Boldface type in text indicates the first instance of terms defined either in the text, in the glossary, or both.
<b>Note</b>	A note contains information that is of special importance to the user.

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# Troubleshooting and Diagnosing Problems

This chapter describes the troubleshooting procedures and diagnostic commands that you can use to solve basic problems with the MicroVAX 3100 Model 40 and Model 80 systems. It contains information on the following:

- Troubleshooting
- Diagnostic tests and commands
- Contacting Digital™ Services

It also lists the information that you must give to your Digital Services representative and where to find this information.

## 1.1 Troubleshooting

If a problem occurs, you must first make sure that all the cables, loopback connectors, and terminators are correctly connected and that the connectors are not damaged, for example, the pins may be broken or short-circuited. Follow these steps:

1. Shut down the operating system following the procedures described in the operating system documentation.
2. Turn off the console terminal and all the peripheral devices such as printers and modems.
3. Turn off all the expansion boxes.
4. Turn off the system unit.
5. Check that the following cables, if installed, are correctly connected at both ends and that the connectors are not damaged:
  - Console terminal cable (linking the console terminal to the system unit)
  - Console terminal power cord
  - System unit power cord
  - Expansion box SCSI cables



- Expansion box power cords
  - ThinWire™ Ethernet cable or standard Ethernet cable
6. Check that the following terminators, if installed, are correctly connected and are not damaged:
- SCSI terminator
  - ThinWire Ethernet terminator (T-connector and two terminators)
  - Standard Ethernet loopback connector

If you have correctly followed steps 1 to 5, the on/off switches on all the components are set to the off (O) position, and you have solved any problems caused by incorrectly connected cables or terminators.

7. Set the on/off switches on the following equipment to the on ( I ) position in the following order:
- a. Expansion boxes
  - b. Peripherals
  - c. Console terminal
  - d. System unit

The system responds with the power-up test display. If it does not, see Section 1.1.1.

### **1.1.1 Using the Troubleshooting Table**

Table 1–1 suggests the corrective actions for certain system problems. If you have a problem with the system, follow these steps:

1. Write down the symptoms of the problem.
2. Check the Symptom column in Table 1–1 for a match.
3. Check the causes of the symptom in the Possible Cause column. If the column lists more than one possible cause, check the possible causes and their suggested solutions in the order listed.
4. Follow the advice in the Suggested Solution column.
5. See Section 1.3 if the problem persists.



**Table 1–1 Basic Troubleshooting**

Symptom	Possible Cause	Suggested Solution
<b>System Problems</b>		
The system unit fan is off or the power light is off.	The power cord is not connected. The power cord may be faulty. The power socket may not be working.	Make sure that all the power cords are connected correctly at both ends. Try a power cord that works or test the power socket with an appliance that works.
	The overload protection circuitry of the power supply may have shut down because of an abnormal condition on the power line.	Turn the system off and then turn it back on.
The power-up display does not show after 20 seconds.	The power supply unit (PSU) is faulty.	Contact your Digital Services representative.
	The terminal cable is not correctly connected.	Make sure that all the cables are connected at both ends.
	The power cord is not connected. The power cord may be faulty. The power socket may not be working.	Make sure that all the power cords are connected correctly at both ends. Try a power cord that works or test the power socket with an appliance that works.
	The terminal fuse may have blown.	Replace the blown terminal fuse. See the terminal documentation.
	The terminal settings may be incorrect.	See the <i>MicroVAX 3100 Model 40 and Model 80 Operator Information</i> manual for the list of correct terminal settings. See the terminal documentation for information on setting up the terminal.
	The port to which the terminal connects may be faulty.	Try connecting the terminal to another system. If this solution works, the port to which the terminal was connected is faulty. If the terminal still does not operate, it is faulty. In either case, contact your Digital Services representative.

(continued on next page)

**Table 1-1 (Cont.) Basic Troubleshooting**

Symptom	Possible Cause	Suggested Solution
<b>System Problems</b>		
	The terminal cable may be faulty.	Connect the terminal cable and the terminal to another system. If the connected terminal works, the DZ circuitry or MMJ connector is faulty. Otherwise, the cable is faulty. Contact your Digital Services representative.
	The break/enable switch is in the wrong position.	Turn off the system unit. Set the break/enable switch to the down position, then turn on the system unit.
The power-up display contains question marks.	A soft error or hard error.	One question mark (?) followed by numbers in the power-up display indicates a soft error. Do not take any action unless the system fails to boot. If the system does not boot, see Section 1.3.  Two question marks (??) followed by numbers in the power-up display indicate a hard error. See Section 1.3.
The power-up test display contains unexpected characters.	The terminal settings are incorrect or the DZ circuitry is faulty.	Make sure the terminal settings are correct, then run the power-up test again. If the terminal is set correctly, contact your Digital Services representative.
The system fails to boot the operating system.	The system defaults are incorrectly set.	Set the system defaults as described in the <i>VMS Factory Installed Software User Guide</i> , then try booting the system again. If the system still fails to boot, contact your Digital Services representative.

(continued on next page)



**Table 1-1 (Cont.) Basic Troubleshooting**

Symptom	Possible Cause	Suggested Solution
<b>RRD42 Compact Disc Drive Problems</b>		
The drive does not accept the caddy.	The disc is upside-down in the caddy or it is not placed correctly in the caddy.	Remove the disc from the caddy and reinsert it properly.
The eject button fails to eject the caddy.	The eject button is disabled by software.	Reenable the eject button or manually eject the caddy.
	The system does not have power.	Set the system unit on/off switch to the on ( I ) position and press the eject button again.

(continued on next page)

**Table 1-1 (Cont.) Basic Troubleshooting**

Symptom	Possible Cause	Suggested Solution
<b>TZ30 Tape Drive Problems</b>		
The TZ30 green LED flashes rapidly.	The drive mechanism is faulty or the tape cartridge is damaged.	Press and release the unload button to clear the fault. If the LED continues to flash, do not try to remove the tape cartridge or use the tape drive. Contact your Digital Services representative.
The TZ30 does not operate.	The drive does not contain a tape cartridge.	Insert the tape cartridge and press the unload button.
The operate lever does not slide.	The tape cartridge is in use.	Wait for the green LED to turn on and try again. If the problem persists, do not use the drive. Contact your Digital Services representative.
The operate lever does not lock.	The tape cartridge is not inserted correctly.	Reinsert the tape cartridge. If the problem persists, contact your Digital Services representative.
The tape does not load.		Press and release the unload button. Wait for the green LED to turn on before sliding the lever and removing the tape. If the LED flashes, contact your Digital Services representative.
The system cannot write to the tape.	The write-protect switch is in the write-protect position.	If the write-protect LED is on, remove the tape, reset the switch and try writing to the tape again. If the problem persists, contact your Digital Services representative.
The data read from the tape cartridge is corrupted.	The tape drive head may be dirty.	See the <i>MicroVAX 3100 Model 40 and Model 80 Operator Information</i> manual for information on cleaning the drive head.
The tape does not eject.	The tape is not rewound. The operate lever is in the lock position.	Follow the procedure for removing a tape from the TZ30 described in the <i>MicroVAX 3100 Model 40 and Model 80 Operator Information</i> manual.

(continued on next page)



**Table 1–1 (Cont.) Basic Troubleshooting**

Symptom	Possible Cause	Suggested Solution
<b>TZK10 Quarter Inch Cartridge (QIC) Tape Drive Problems</b>		
The data read from the QIC tape is corrupted.	The drive head is dirty.	Clean the drive head. See the <i>MicroVAX 3100 Model 40 and Model 80 Operator Information</i> manual.
The system cannot write to the QIC tape.	The write-protect switch is in the write-protect position.	Remove the QIC tape, reset the switch and try writing to the QIC tape again. If the problem persists, contact your Digital Services representative.
The system cannot read from or write to the QIC tape.	The QIC tape may be faulty.	Remove the QIC tape. If the amber LED turns off when you remove the QIC tape, the tape is probably faulty. Try a different QIC tape. If the amber LED stays on or if the problem persists, contact your Digital Services representative.

(continued on next page)

**Table 1–1 (Cont.) Basic Troubleshooting**

Symptom	Possible Cause	Suggested Solution
<b>RX™26 Diskette Drive Problems</b>		
The system cannot read from or write to the diskette.	The diskette is not formatted.	Format the diskette.
	The diskette is not correctly inserted.	Eject the diskette. Try inserting the diskette again.
	The diskette is faulty.	Try a different diskette.
	The diskette drive is faulty.	Contact your Digital Services representative.
	The diskette density is incorrect.	The RX26 accepts only high-density (HD) or extra-density (ED) diskettes.
	The diskette drive head may be dirty.	See the <i>MicroVAX 3100 Model 40 and Model 80 Operator Information</i> manual for information on cleaning the diskette drive head.
The system can read from but cannot write to a diskette.	The write-protect switch is in the write-protect position.	Eject the diskette and reset the switch. Try writing to the diskette again.
The diskette does not eject.	The diskette is incorrectly positioned in the drive.	Gently press the diskette with your finger and reposition it. Press the eject button again.



## 1.2 Diagnostic Tests and Commands

There are a number of diagnostic tests and commands that can help you to isolate a problem with the system unit. These tests and commands are as follows:

- Power-up tests
- Self-tests<sup>1</sup>
- Configuration display<sup>1</sup>
- System exerciser<sup>1</sup>
- Error display<sup>1</sup>

The following sections describe these tests and commands.

---

<sup>1</sup> You can use these tests and commands in privileged console mode only if the console security feature is enabled and the password is set. See the *MicroVAX 3100 Model 40 and Model 80 Customer Technical Information* manual for information on the console security feature.

## 1.2.1 Power-Up Tests

The system runs the power-up tests each time you turn on the system. If the system passes the tests, it responds with a display similar to the following:

```
KA45-A V1.0 ❶  
08-00-2B-1A-0B-BB ❷  
16MB ❸  
████████████████████████████████████████████████████████████████████████████████ ❹  
OK  
>>> ❺
```

- ❶ Central Processing Unit (CPU) Name and Firmware Version Number—The KA45 is the CPU in the Model 40 system; the KA47 is the CPU in the Model 80 system. V1.0 is the firmware version number.
- ❷ Ethernet Hardware Address.
- ❸ Memory Size.
- ❹ Status Bar—The completion mark ( | ) indicates the full extent of the status bar. When the status bar reaches the completion mark, the power-up test is complete. On some terminals, the status bars are displayed as a line of number signs (#).
- ❺ Console Prompt<sup>1</sup>.

---

<sup>1</sup> The system may not display the console prompt if the default recovery action is set to boot or restart. See the *MicroVAX 3100 Model 40 and Model 80 Customer Technical Information* manual for more information on system defaults.



If the power-up tests encounter an error, the system responds with a display similar to the following:

```
KA45-A V1.0  
08-00-2B-1A-0B-BB  
16MB
```

```
?? 001 9 NI 0104
```

```
① ② ③ ④ ⑤ ⑥
```

```
>>>
```

- ❶ Error Type—Two question marks (??) indicate a hard error, that is, a fatal error that prevents the system from booting. One question mark (?) indicates a soft error, that is, a nonfatal error that does not prevent the system from booting.
- ❷ Field Replaceable Unit (FRU).
- ❸ Device Number.
- ❹ Device Mnemonic.
- ❺ Error Message.
- ❻ Completion Mark—The completion mark ( | ) indicates the full extent of the status bar when the power-up test is successful.

Usually, you can ignore soft errors. Soft errors are often caused by temporary problems, and the system can boot despite the error. Hard errors, however, usually indicate a more serious problem that may prevent the system from successfully booting. If you encounter a hard error, see Section 1.2.2.

## 1.2.2 Self-Tests

Self-tests perform the same tests as the power-up tests except for one difference; the power-up tests test all the devices in the system, whereas the self-tests allow you to test a single device.

If you encounter a hard error in the power-up test display, follow these steps:

1. Write down the number or mnemonic of the tests that failed.

In the examples in this section, device 9 (NI), the Ethernet device, has a hard error associated with it. Table 1-2 lists the device numbers, mnemonics, and names of the system devices.

2. Make sure that all the required cables and terminators are securely connected to the proper ports by following the procedure described in Section 1.1.
3. Run the self-test on each device that failed by entering a command similar to the following:

```
>>> TEST 9
```

Alternatively, instead of the device number, you can enter the command using the device mnemonic:

```
>>> TEST NI
```

If the self-test is successful, the system responds with the following display:

```
>>> TEST 9
```

```
█
```

```
OK
```

```
>>>
```



If the device fails the self-test, the system responds with the following display:

```
>>> TEST 9
```

```
?? 001 9 NI 0172
```

```
84 FAIL
```

```
>>>
```

4. If the error remains, contact your Digital Services representative (see Section 1.3).

Table 1-2 lists all the device numbers, mnemonics, and device names.

**Table 1-2 Device Numbers, Mnemonics, and Names**

Number	Mnemonic	Device Name
1	NVR	Nonvolatile RAM
3	DZ	Serial line controller
4	CACHE	Cache memory
5	MEM	System internal memory
6	FPU	Floating point unit
7	IT	Interval timer
8	SYS	Miscellaneous CPU module hardware
9	NI	Network interface (Ethernet)
10	SCSI	SCSI controller
12	COMM	Synchronous communications option
14	ASYNC	Asynchronous communications option

### 1.2.3 Configuration Display

The configuration display shows the system configuration and the error messages that were detected while the most recent power-up tests and self-tests were running. If you add expansion boxes to the system and do not run the power-up tests or self-tests, the configuration display does not recognize the reconfiguration. Enter the following command to see the configuration display:

>>> SHOW CONFIG

If the system does not detect any errors in the most recent power-up tests and self-tests, it responds with a configuration display similar to the following:

```
KA45-A V1.0
08-00-2B-16-44-48
16MB
  ①      ②      ③
DEVNBR  DEVNAM  INFO
-----
1         NVR    OK
3         DZ     OK
4        CACHE  OK
5         MEM    OK
           8MB = SY=8MB, S0/1=8MB, S2/3=0MB, S4/5=0MB ④
6         FPU    OK
7         IT     OK
8         SYS    OK
9         NI     OK
10        SCSI   OK
           3-RZ23L  6-INITR ⑤
12        COMM   OK
           DSW41/42 1 CHANNEL V3.11-47
14        ASYNC  DSW41/2    V1.5
```

- ① Device Number Column.
- ② Device Mnemonic Column.
- ③ Device Status Column.
- ④ Memory Configuration—The total internal capacity of the system equals the memory on the system module (SY) plus the optional memory in each of the internal banks (S0 to S5). In this example, the capacity is 16M bytes.
- ⑤ SCSI IDs and SCSI Device Names.



If the system detects errors in the most recent power-up tests and self-tests, it responds with a configuration display similar to the following:

```
KA45-A V1.0
08-00-2B-16-44-48
16MB
DEVNBR  DEVNAM      INFO
-----
1         NVR        OK
3         DZ         OK
4         CACHE      OK
5         MEM        OK
                        8MB = SY=8MB, S0/1=8MB, S2/3=0MB, S4/5=0MB
6         FPU        OK
7         IT         OK
8         SYS        OK
9         NI         ?? 001  0104 ❶
10        SCSI       OK
                        3-RZ23L  6-INITR
12        COMM       OK
                        DSW41/42 1 CHANNEL V3.11-47
14        ASYNC      DHW41/2      V1.5
```

- ❶ Error Information—Write down this information before you contact your Digital Services representative.

### 1.2.4 System Exerciser

Use the system exerciser if the system develops intermittent problems. The system exerciser simulates the operating system by testing the simultaneous operation of multiple devices in the system. The system runs the tests twice and then shows the results in the system exerciser display.

---

#### Note

---

Remove the removable media from all the internal and external removable media devices.

---

To run the system exerciser, enter the following command:

```
>>> TEST 100
```

The system responds with a display similar to the following:

```

  ①      ②      ③
KA45/47 V1.0   System Test CU           0 00:01:29

  3    DZ #
  9    NI #
 10    SCSI #
 12    COMM #           0
 14    ASYNC #

 ④      ⑤ ⑥
***** SYT_DISP_Y_SUMRY (('1'=Y), ('0'=N)) ..... ? ⑦
```

- ① Central Processing Unit (CPU) Name and Firmware Version Number – KA45 is the CPU in the Model 40 system; KA47 is the CPU in the Model 80 system. V1.0 is the firmware version number.
- ② Test Environment—CU is the customer environment.
- ③ The Duration of the Test—Days hours:minutes:seconds.
- ④ Device Number.
- ⑤ Device Mnemonic.
- ⑥ Status Bars—The status bars show the progress of each test. On some terminals, the status bars are displayed as a line of number signs (#), on other terminals the status bars are solid lines.
- ⑦ A prompt for summary screens (see Section 1.2.5). Enter 1 to display the summary screens; enter 0 to return to the console prompt.



If a device fails the system exerciser tests, the system displays the following:

```
KA45/47 V1.0   System Test CU           0 00:00:59
```

```
3    DZ #
```

```
9    NI #
```

```
10   SCSI #
```

```
12   COMM #                                0
```

```
❶ ❷ ❸ ❹ ❺                                ❻  
?? 14 ASYNC 40 0305 0 00:01:26
```

```
***** SYT_DISPLY_SUMRY (('1'=Y), ('0'=N))..... ? ❼
```

❶ **Error Report**—The error report replaces the status bar when a device fails the system exerciser tests. Two question marks (??) indicate a hard error, that is, an error that you must correct before booting the system. One question mark (?) indicates a soft error, that is, an error that you do not have to correct before booting the system.

❷ **Device Number.**

❸ **Device Mnemonic.**

❹ **Field Replaceable Unit (FRU).**

❺ **Error Message.**

❻ **Elapsed Time**—The time elapsed since the test started.

❼ **A prompt for the summary screens** (see Section 1.2.5). Enter 1 to display the summary screens; enter 0 to return to the console prompt.

If you see an error report, write it down. Then contact your Digital Services representative (see Section 1.3).

## 1.2.5 Summary Screens

The system exerciser generates summary screens, which show the progress or results of the most recent system exerciser test. You do not need to use or understand the summary screens. However, your Digital Services representative might ask you to display a summary screen. The system displays a summary screen when one of the following conditions is satisfied:

- The system has completed the system exerciser test and you choose to view the summary screens
- You press Ctrl/C to interrupt a system exerciser test and you choose to view the summary screen
- You enter the command SHOW ESTAT

The summary screens are displayed in the order in which the tests were performed. When the system exerciser is completed, it displays a prompt at the bottom of the screen as follows:

```
***** SYT_DISP_Y_SUMRY (('1'=Y), ('0'=N)) ..... ?
```

Enter 1 to view the first summary screen, or 0 to return to the console prompt.

The following display shows a summary screen for the DZ test that was performed during a system exerciser test:



```
***** FST EXT_ERRPT 3DZ 0 00:01:25 *****
```

Line	L_Param	Chr_Xmt	Chr_Rec	Error
0		00000780	00000780	***** No Err *****
1		00000780	00000780	***** No Err *****
2		00000780	00000780	***** No Err *****
3		00000000	00000000	*Not Tstd - Cons_lin*

```
***** SYSTST_NXT_SCR ((' ('1'=Y), ('0'=N))..... ?
```

## 1.2.6 Error Display

The error display lists the errors detected by the most recent self-test or system exerciser test. To see the error display, enter the following command:

```
>>> SHOW ERROR
```

The system responds with a display similar to the following:

```
? 000 1 NVR 0003
?? 001 9 NI 0068
001 0010 00000000 00000020 000000AA 00000000
```

Write down this information before you contact your Digital Services representative.

## 1.3 Contacting Digital Services

---

### WARNING

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**Only authorized service personnel should service this equipment.**

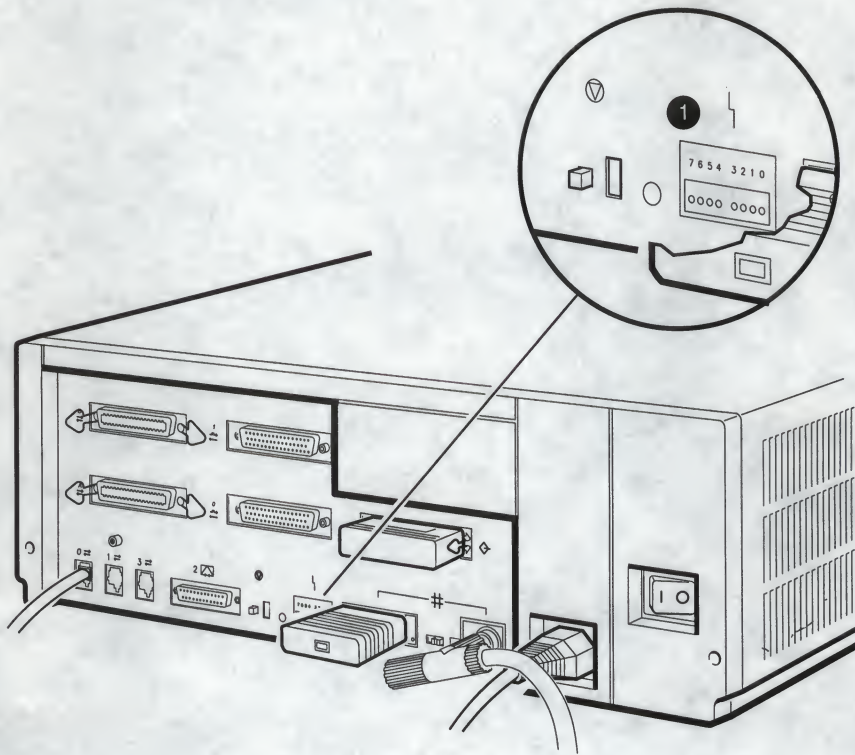
---

If you have followed the procedures in this chapter but the problem remains unsolved, your Digital Services representative can help you. Before you place your call, follow these steps:

1. Write down a description of the problem, including the error messages and the number of the self-tests that failed.
2. Look at the status LED display on the back of the system unit and write down the numbers of the LEDs that are on (see Figure 1-1).
3. List the steps you have taken to correct the problem and the results you got.
4. Write down the serial and model numbers of the system unit and any connected peripheral devices. These numbers are usually printed on a label on the back of the device.



**Figure 1-1 Status LED Display**



RE\_EN06326A\_91

**1 Status LED Display**

CHARTERED BY THE STATE OF NEW YORK



NEW YORK, N.Y.



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## C

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Troubleshooting and Diagnostic Information  
EK-A0518-TM.001

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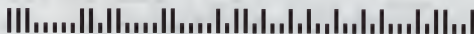
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